



100# P-289A

National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: September 24, 1987

In reply refer to: P-87-34

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On March 12, 1986, a contractor operating a backhoe in Forth Worth, Texas, snagged, lifted, and punctured a Lone Star Gas Company natural gas service line at 9:15 a.m. The gas service line supplied gas to an unoccupied building. Gas under 22 psi pressure escaped into the air and also leaked at a point 18 feet under the building where the service line had also been pulled apart at a girth weld.

The contractor notified the Lone Star Gas Company of the line puncture and a gas company crew and supervisor were dispatched to the scene. While the gas company crew was attempting to shut off the flow of gas to the punctured pipe, the unoccupied building exploded and burned at 10:09 a.m. Twenty-two persons were injured, the unoccupied building was destroyed, and 40 other buildings were damaged. Fifty-seven automobiles stored inside the destroyed building were damaged or destroyed. 1/

On February 20, 1986, using a copy of the gas company map for the area and information provided by the contractor about the proposed excavation, the line locator identified and marked across the path of the proposed excavation the 1 1/4-inch plastic gas service line located toward the east side of the building. The map showed the 1 1/4-inch line accurately. He also used a pipeline locator to verify the exact location of this line. He followed gas company procedures and did a thorough, accurate job of marking the 1 1/4-inch line where it crossed the proposed excavation toward the east side of the building.

The line locator placed an 18-inch mark at the south curb of East Lancaster Avenue over a 2 1/2-inch gas service line that ran from the 2-inch valve to the curb. He marked this line based on the indentations in the pavement and also, possibly, because of the indentation over the 2-inch gate valve. The 2 1/2-inch gas service line was not, however, shown on the map. Although the line locator spray-painted one 18-inch-long mark over the indentation, he did not paint any more marks beyond the square patch at the curb. This action suggests that the line locator may have assumed, because of the square patch, that the service line into the building had been cut and plugged at the curb and taken out of service. This possibility is corroborated by statements made by the contractor and city personnel that indicate that they understood from the line locator that the line probably was dead at the curb.

1/ For more detailed information, read Pipeline Accident Report--"Lone Star Gas Company Natural Gas Explosion and Fire, Fort Worth, Texas, March 12, 1986" (NTSB/PAR-87/03).

Although the pavement indentations indicated that work had been done beneath the surface of the asphalt, such indentations did not necessarily mean that the line had been cut and plugged. In addition, the line locator knew, based on his prior experience as a meter reader, that a line had at one time served the building. However, the map he was using did not show this line. Thus, the line locator had reason to question the existence and status of the line at the curb where the 18-inch line that he had spray-painted ended. However, he did not take any action to verify the line had been taken out of service.

The line locator could have called the dispatcher and requested that the billing records be checked to determine if the information on the map was correct. Based on the experience of the gas company supervisor who later responded to the accident, the line locator could have learned within a short time (as did the supervisor during the accident) that the gas service line was active and that a 2 1/2-inch line did in fact extend through the route of the proposed excavation.

The line locator also could have verified his assumption by trying to locate the 2 1/2-inch line with his pipeline locator as he did for the 1 1/4-inch plastic line. While the line locator said that he did not believe he could use his pipeline locator in that area because of interference from the buried electric line, he made no attempt to confirm this assumption. Based on information provided by the electric utility, there should have been no interference.

The line locator also could have had the contractor break through the pavement within the area of the proposed excavation. The line locator then could have used a probe bar or he could have had the contractor use hand tools to remove dirt from the area to determine if a gas line existed within the route of the proposed excavation.

While the line locator could have taken these actions to determine the existence and status of the line, he did not do so. Had gas company procedures adequately covered the actions he was expected to take to verify the existence and operational status of the line and had he been trained accordingly, it is likely that he would have marked the 2 1/2-inch line as thoroughly and accurately as he marked the 1 1/4-inch line. This action may have prevented the accident. Even though the line locator could have acted to verify the status of the line, he would not have had to rely on these other actions if the gas system map had shown the line.

Since 1977, the Safety Board has investigated three pipeline accidents in which the inaccuracy or absence of gas distribution system maps caused or contributed to the accidents. 2/ On August 21, 1978, the Board recommended that the Materials Transportation Bureau (MTB), 3/ Research and Special Programs Administration of the U.S. Department of Transportation:

P-78-50

Revise 49 CFR 192 to require that gas company systems maps and records be maintained accurately to identify the locations, size, and operating pressure of all of their pipelines.

2/ Greenwich, Connecticut, Connecticut Natural Gas Corp., May 25, 1977, Safety Recommendations P-77-24 through -26; Mansfield, Ohio, Columbia Gas of Ohio, Inc., May 17, 1978, Safety Recommendations P-78-45 through -52; Pipeline Accident Report—"The Gas Company of New Mexico, Natural Gas Explosion and Fire, Portales, New Mexico, June 28, 1982" (NTSB/PAR-83/1).

3/ MTB no longer exists. The Office of Pipeline Safety, which is now handling this issue, used to be located within the MTB.

In a letter to the Safety Board dated November 8, 1978, the MTB stated that:

MTB has completed its review of the NTSB report and has concluded that the implementation of these Recommendations would improve pipeline safety. Because both require a revision of the Federal Regulations, we will consider these Recommendations in developing our regulatory schedule commencing in January 1979.

On November 29, 1979, the MTB issued an Advance Notice of Proposed Rulemaking (ANPRM), "Transportation of Natural Gas and Other Gas by Pipeline; Maps and Records," Docket PS-61, inviting comments "relative to the need to establish regulations which would require gas pipeline operators to have adequate maps and records of their pipeline systems."

Among those "data items" that MTB included in its ANPRM for "Maps and Records" were the following:

Ambient conditions

1. Climate
2. Soil/Geology
3. Seismic
4. Population (close location studies)
5. Demographic.

MTB received 83 comments on the ANPRM; most respondents were opposed to a Federal requirement for maps and other records and stated that the proposed requirements already were being fulfilled. At the Technical Pipeline Safety Standards Committee Meeting of April 15, 1980, MTB stated its position that the proposed regulations were directed at companies that did not have adequate maps and records and needed the incentive of such a regulation.

On February 29, 1980, the Safety Board commented in support of the ANPRM, stating that:

... Maps and records sufficient to identify and locate the major components of buried pipelines are essential for a gas pipeline operator to conduct safely the expansion, operation, and maintenance activities normal to this industry. Also, these records are required to provide early location information to persons proposing to excavate near gas facilities.

... Safety Board reports of gas pipeline accidents have identified the clear need for such improved records. Operators of liquid pipelines subject to 49 CFR 195 are now required to maintain maps and other pipeline identification and location records and we urge the MTB to act expeditiously to require similar records for gas systems.

The Safety Board intended, when it issued Safety Recommendation P-78-50, that the MTB would "... require that gas company system maps and records be maintained accurately to identify the locations, size, and operating pressure of all of their pipelines." The Safety Board did not intend for the MTB to go beyond recording the location of pipelines on the maps and records by incorporating expensive, extraneous requirements, such as those included as "Ambient Conditions" into the maps and records.

More than 2 years later, the MTB announced its intention to withdraw its rulemaking project concerning maps and other record requirements for natural gas pipelines because it had determined that a requirement for such documents would not be cost-beneficial. (See 47 Federal Register 48666, October 28, 1982.) MTB actually withdrew its ANPRM on September 17, 1984. (See 49 Federal Register 36415.) The notice of withdrawal stated that the MTB decision was based, in part, upon its April 1981 report entitled, "Cost Benefit Analysis of Increased Natural Gas Pipeline Safety Regulations." This report was issued in response to the requirements contained in Section 110 of the Pipeline Safety Act of 1979 (Act). This section of the Act required the Secretary of Transportation to study the adequacy and cost-effectiveness of existing pipeline safety regulations and also to address, among other things, the issue of "whether natural gas pipeline safety could be significantly enhanced in a cost-effective manner by regulations requiring operators to prepare and maintain a general description of their natural gas pipeline facilities."

On December 11, 1982, the Safety Board closed Safety Recommendation P-78-50 as "Unacceptable Action." However, the Safety Board still believes strongly that gas company system maps and records must be maintained accurately and that Federal regulations should be promulgated to direct gas companies to this end.

The MTB review of the practices of pipeline operators at that time was based in part on responses to the ANPRM from the Interstate Natural Gas Association of America (INGAA) and the American Gas Association (AGA). These two industry trade groups provided comments "on typical practices of pipeline operators as they relate to the data elements that might be required for the description of pipeline facilities." Cost estimates for preparing and maintaining a description of pipeline systems as described above were obtained from independent pipeline companies and were used to estimate a cost for the gas industry as a whole.

The MTB report did not develop or compare the benefits that might be expected if pipeline operators prepared and maintained the proposed description of their pipeline systems, nor did it discuss the possible use of the proposed data in relation to the prevention of excavation damages. The fact that accidents have occurred because a pipeline operator did not know the location of gas pipeline facilities was not emphasized in the report, and the resultant loss of life, injuries to persons, and property damage were not considered. The MTB report did recognize that the operators of large pipeline systems voluntarily incur the costs associated with preparing and maintaining maps and other records necessary for the location of their buried pipeline facilities, but the report did not address the reasons why they had elected to do so.

The MTB report concluded that, based on a 20-year life for such records, to require pipeline operators to develop and maintain a description of their pipeline facilities, as defined in the report, would not "warrant the costs of compliance." The report did not consider requiring alternatives other than the MTB-defined "system description" or individual elements or combinations of individual elements contained in the MTB-defined "system description."

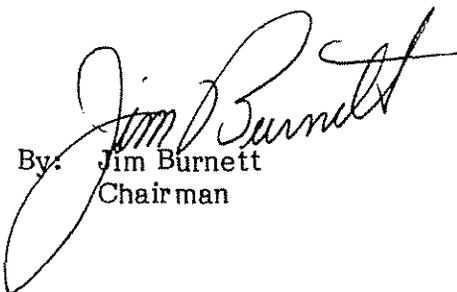
The circumstances of the Fort Worth, Texas, accident provide further evidence that the failure of a gas distribution company to provide its employees with accurate maps or records of its pipeline facilities and its failure to train employees properly in the use of these records will continue to result in excavation damage to its facilities, and death or injury to the public. The Safety Board remains convinced that a Federal regulation requiring pipeline companies to keep their maps and records current is necessary for the safe operation and maintenance of gas pipeline systems.

Therefore, as a result of its investigation, the National Transportation Safety Board recommends that the Office of Pipeline Safety of the Research and Special Programs Administration, Department of Transportation:

Revise 49 CFR 192 to require that gas company system maps and records be maintained accurately to identify the locations, size, and operations pressure of all of their pipelines; however, this revision should not include nonpertinent factors as appeared in the Advance Notice of Proposed Rulemaking on this issue in Docket PS-61, November 29, 1979. (Class III, Longer Term Action) (P-87-34)

The Safety Board also issued Safety Recommendations P-87-29 through -33 to the Lone Star Gas Company.

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER, NALL, and KOLSTAD, Members, concurred in this recommendation.

By:  Jim Burnett
Chairman